

Annual Report and Accounts

FOR THE YEAR ENDED 30TH JUNE, 1978

Council and Standing Committees, 1977-1978

President: P. A. von Wielligh.

Vice-Presidents: Dr M. G. Atmore and D. A. Viljoen.

Honorary Treasurer: J. K. E. Douglas.

Immediate Past President: Dr M. D. G. Salamon.

Members of Council: J. D. Austin, A. N. Brown, A. A. Hazell, Dr P. R. Jochens, Prof. R. P. King, Dr D. G. Krige, Prof. F. Q. P. Leiding, D. G. Malan, J. C. Mostert, H. G. M. Rose, W. T. Ruhmer, A. A. Sealey, R. A. von Maltitz.

Chairman, Witbank-Middelburg Branch: T. S. Wilmot.

Chairman, Orange Free State-Klerksdorp Branch: A. N. Shand.

Past Presidents Serving on Council: R. J. Adamson, H. Britten, J. K. E. Douglas, Prof. D. D. Howat, Dr J. P. Hugo, D. G. Maxwell, Prof. R. P. Plewman, Dr R. E. Robinson, P. W. J. van Rensburg.

Standing Committee Chairmen: Membership, D. A. Viljoen; Technical Programme — Metallurgy, Dr P. R. Jochens; Technical Programme — Mining, Dr D. K. Krige; Vacation School — Metallurgy, Prof. R. P. King; Vacation School — Mining, Dr M. D. G. Salamon; Awards, Dr M. D. G. Salamon; Excursions, Dr M. G. Atmore; Adjudication, Dr M. D. G. Salamon; Constitution, Rules, and Policy, Dr M. D. G. Salamon; Mines and Works, P. A. von Wielligh; Education, Dr M. D. G. Salamon; Monograph Series, Dr R. E. Robinson; Phoenix National Committee, Dr R. E. Robinson; Pyrometallurgical Discussion Group Convenor, Dr J. B. See/Dr D. I. Ossin.

Representatives on Other Bodies

Associated Scientific and Technical Societies:

Members: Dr R. E. Robinson and Dr M. D. G. Salamon.

Alternates: P. A. von Wielligh and Dr M. G. Atmore.

Federation of Societies of Professional Engineers:

Members: D. A. Viljoen and Prof. R. P. Plewman.

Alternates: Dr M. G. Atmore and Dr M. D. G. Salamon.

FSPE Executive Committee:

Member: D. A. Viljoen.

FSPE Technician and Education Liaison Committee:

Member: R. A. von Maltitz.

FSPE Publicity Committee:

Member: J. D. Austin.

South African Council for Professional Engineers (Institute Nominees):

Member: P. W. J. van Rensburg.

Alternate: W. T. Ruhmer.

South African National Committee on Tunnelling:

Member: D. G. Malan.

Alternate: Prof. R. P. Plewman.

Engineers' Liaison Committee (Pretoria):

Member: Dr J. P. Hugo.

Alternate: Prof. F. Q. P. Leiding.

World Mining Congress — National Committee:

Members: Dr M. D. G. Salamon, Prof. R. P. Plewman, and Prof. F. Q. P. Leiding.

Membership

Fourteen Fellows, fourteen Members, seven Associate Members, nineteen Graduates, twelve Associates, sixty-four Students, and one Company Affiliate were elected during the year. One Member, one Associate Member, and one Associate transferred to Fellow, eleven Graduates and three Students transferred to Member, and one Associate transferred to Graduate. One Fellow and one Member were re-instated. Twelve Fellows and two Members were admitted to retired membership. Sixteen Fellows, three Retired Fellows, one Retired Member, ten Members, one Associate Member, seven Associates, one Graduate, one Student, and three Company Affiliates resigned. Two Fellows, four Members, one Associate Member, and four Associates were removed from the membership roll.

During the year, the Membership Committee decided that all Associate Members should be issued with certificates of membership retrospectively, and that Student and Graduate members undergoing military training would not be liable for full subscriptions; in the case of Graduates, only R5 would be required, while the Student subscription would be waived.

The Membership Committee wishes to record its appreciation to Mr D. G. Malan for having examined the records of all Corporate members of the Institute to ascertain the percentage registered or registerable as Professional Engineers. This percentage was found to be 73,2 per cent, which, it is gratifying to note, is well within the one-third non-registerable category permitted by the South African Council for Professional Engineers.

A statement of membership as at 30th June, 1978 and the end of the previous year is shown in the following tabulation:

	30th June, 1977	30th June, 1978
Honorary Life Fellows	16	15
Honorary Fellows	8	8
Life Fellows	171	172
Fellows	547	515
Members	517	570
Associate Members	21	29
Graduates	105	118
Associates	210	205
Students	172	225
Company Affiliates	81	79
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Obituaries

Council records with deep regret the death during the year of the following members: T. K. Prentice, W. E. Gooday, Honorary Life Fellows and Past Presidents; B. S. Allen, J. A. Becking, L. H. Mellor, C. A. Pratt, W. T. Stobart, Life Fellows; J. P. Burls, E. Cameron, M. L. Fitzgerald, C. G. Hinds, A. J. Petrick, H. O. Reisener, N. D. Shuttleworth, N. Soldan, J. Whitehouse, Fellows; T. Gemmell, J. S. A. Oelofse, W. D. Rowe, R. L. J. Shearman, G. M. Thain, Associates.

Finance

Revenue for the year exceeded expenditure by R16 260. Of this, R9000 was transferred to the Education Fund and R353 to the MacArthur Forrest Fund. The balance of R6907 was transferred to the Accumulated Fund, which now stands at R92 547 compared with R85 640 at the end of last year.

Revenue from the vacation schools and the colloquia and symposia held during the year exceeded expenditure by R9019 and R4915 respectively. The fees charged for these functions are conservatively based to achieve a breakeven position with the expected number of delegates. However, the popularity of these functions again led to larger numbers attending, thereby giving rise to the substantial surpluses. In the *Journal* account, costs exceeded revenue by R3096. The cost of printing the *Journal* alone rose by R3569 compared with the previous year, an increase of 37 per cent. In the Monograph Series, the costs also exceeded the revenue by R9392. The expenditure was mainly in the printing of the first monograph, the computerization of a world-wide addressee system of potential customers, and in secretarial fees. Shortly before the end of the year, revenue began to be received on the sale of the first monograph, but it is still too soon to judge the viability of this project. If the expected sales are achieved, the Monograph Series will make a useful contribution to funds.

Excluding the cost of the abnormal items (namely, the vacation schools, the colloquia and symposia, and the Monograph Series), general costs, including the publication of the *Journal*, increased from R76 801 to R86 192, an increase of R9391 or 12,2 per cent. Revenue on the same basis increased from R88 056 to R97 911, an increase of R9855 (11,1 per cent), of which R7525 was due to increased subscriptions.

At the end of the year, the book values of the Education Fund and the MacArthur Forrest Memorial Fund were R89 223 and R7357 respectively. The total value of all funds at the year end was R189 127, and most of this is invested in debentures, property leases, building societies, and fixed-interest deposits. Syfrets Trust continue to provide an advisory service on investment, and appreciation of their assistance is recorded.

Education Functions

One of the highlights of the Career Guidance Committee's programme during the past year was the organization of seminars with the students and staff of the Chemical Engineering Departments of Cape Town and Stellenbosch Universities, and the Chemical and Metallurgical Engineering Departments of the Uni-

versities of the Witwatersrand and Pretoria, to discuss and debate the employment of chemical and metallurgical engineers in the mining industry. It is believed that the seminars did a great deal to remove misunderstandings regarding the first few years of post-graduate employment. As a result of the success of these seminars, a similar function is being arranged for mining-engineering students at the University of the Witwatersrand in September, 1978.

Other activities have been concerned with the production of articles for a number of magazines and publications, in particular, a series of career guidance articles on metallurgy for publication in *Archimedes*. Career brochures outlining the professions of mining and metallurgical engineering are in the process of being drafted, and it is hoped that the content will be formalized in the near future.

Arrangements have been made for the Institute to be represented at certain career-guidance evenings that are being held for matriculants at local schools.

The Education Committee has continued to provide encouragement to university students by awarding prizes for academic achievement and leadership qualities. A function at which the newly introduced S.A.I.M.M. prizes were presented to metallurgy and mining students at the Universities of Pretoria and the Witwatersrand was held at the University of Pretoria in March of this year. Dr T. Muller, Chairman of Iscor, addressed the meeting on the topic of mining and the environment. Prizes were awarded to the following students: R. Gould, Miss D. Wiggill, A. W. de Villiers, H. J. Marais, M. J. de Beer, K. Maske, J. R. de Villiers, and J. C. Strydom.

The Phoenix Programme has continued to be successful, and courses were conducted during April and June 1978. In April, Mr D. Walton managed the course, and Mr G. Cox, of the Minerals Manpower Careers Unit, led the case study. In June, Mr C. de Wilzem managed the course, and Mr G. Pienaar, of Pretoria University, led the case study. The latter course was held in Afrikaans, and comprised a number of very enthusiastic science teachers from the Free State. A minerals case-study exercise was held in Cape Town early in the year for trainee teachers and was well attended, as was the second in a series of Old Phoenician reunions.

Journal

The following papers and notes were published in Volume 78 of the *Journal of the South African Institute of Mining and Metallurgy*.

August 1977

Control of air pollution at Rand Carbide Limited, Witbank, by J. Meintjes.

Air pollution and the metallurgical industry, by N. Boegman.

Air pollution in the planning and siting of industries, by G. P. N. Venter.

September 1977

Environmental control in the mining industry, by G. H. Grange.

Some aspects of energy and the environment in the steel industry, by J. J. C. Heynike.

Fill support systems for deep-level gold mines, by S. J. Patchet.

October 1977

The mechanism and rate of reduction of Mamatwan manganese ore fines by carbon, by W. D. Grimsley, J. B. See, and R. P. King.

Longwall mining, with particular reference to its implementation in South African collieries, by R. G. Jurd.

Restoration of the dolomite water balance at Western Areas Gold Mining Company Limited, by A. Vogelzang.

November 1977

Presidential Address: Minerals and the survival of mankind, by P. A. von Wielligh.

December 1977

Phenomena relating to the failure of hard rock adjacent to an indenter, by M. Hood.

Stress fracturing around a deep-level bored tunnel, by T. R. Stacey and C. L. de Jongh.

The recovery of sulphur, uranium, and gold from residues, by W. T. Ruhmer, F. Botha, and J. S. Adams.

January 1978

Mathematical unification of an equation for solute recoveries in countercurrent decantation, by E. Barnea.

The intensive cyanidation of gold-plant gravity concentrates, by R. J. Davidson, G. A. Brown, C. G. Schmidt, N. W. Hanf, D. Duncanson, and J. D. Taylor.

A brief description of a new metallurgical plant at St Helena Gold Mines, by G. J. C. Young.

February 1978

Trials on blindhole boring in South African gold mines, by W. J. van den Berg and J. G. Taylor.

The introduction of a tunnel borer into a South African gold mine, by J. G. Taylor, R. N. Taylor, and A. E. Hall.

The evaluation of five flowsheets for the recovery of uranium from Witwatersrand leach pulps, by E. B. Viljoen and D. W. Boydell.

March 1978

Progress in the development of mechanized stoping methods, by N. C. Joughin.

A comparison between geostatistical analyses and sedimentological studies at the Hartebeesfontein gold mine, by E. J. Magri.

The planning of mining-equipment trials, by M. G. Adamson and B. D. H. Phillips.

April 1978

Strain-controlled tests on model mine supports, by G. E. Blight.

The introduction of concrete sausage packs at Rustenburg Platinum Mines Limited, by S. Stone.

Blindhole boring at Buffelsfontein Gold Mining Company Limited, by R. C. More O'Ferrall and W. G. Goulding.

May 1978

A metallurgical test programme for mine-plant projects, by J. Kitagawa.

The use of linear programming in the short-term planning of stoping production in gold mines, by R. M. Murray and E. J. Magri.

June 1978

Basic engineering principles for the design of sandwich-pack support, by W. D. Ortlepp.

Slime-cement fill as a stope support for gold mines, by R. C. More-O'Ferrall and R. J. Macaulay.

The grouted skeleton pack, by M. G. Spengler.

July 1978

The development of a continuous fluidized-bed ion exchange in South Africa and its use in the recovery of uranium, by A. K. Haines.

The design and operation of continuous ion-exchange demonstration plant for the recovery of uranium, by W. M. Craig, A. K. Haines, D. I. Nicol, C. M. Olën, M. E. E. Douglas, and G. D. Louw.

A pilot-plant investigation of a kinetic model for flotation, by R. P. King.

Student Prizes

Prizes for the best student papers, written in part fulfilment of the B.Sc. Engineering degree and submitted to the Institute for consideration, were awarded as follows:

Mining

Selection of mining equipment in mechanizing an existing low profile low production coal mine, by M. J. de Beer.

Some rock mechanics aspects of deep level mining, by G. L. Waller.

Metallurgy

The effect of sulphide inclusions on the impact strength of 18%Cr-2%Mo ferritic stainless steels, by C. J. Gross.

Silver Medal Awards

Papers published in the latter part of Volume 77 and the first part of Volume 78 of the *Journal* were considered eligible for an award by Council, and the under-noted authors achieved the distinction of a silver medal:

Dr A. Whillier and Dr J. van der Walt for their paper entitled 'Gravity-fed systems in mines' (published in the April 1977 issue of the *Journal*).

Excursions

Contrary to the previous policy, which arose from the adverse economic conditions as well as severe fuel restrictions, the Council this year decided to make a greater effort in the field of technical excursions. It was originally hoped that the number might be increased to three, as against the single excursion held in the previous year. However, in view of the Orange Free State Colloquium and the large number of members who were able to participate in the Hong Kong Congress, it was finally decided to have two excursions. The first of these, on Wednesday, 22nd February, 1978, was to Vecor Heavy Engineering Limited, Vanderbijlpark, where the management and staff had gone to considerable pains to arrange a most interesting and instructive visit, with particular emphasis on their mining-industry activities. The visit was an outstanding success, as was the subsequent excursion to Randfontein Estates on Wednesday, 28th June, 1978, when 100 members were shown many aspects of the newer surface activities of the Cooke Section of this famous gold and uranium mine. The

Institute is very grateful to the hosts on both occasions for their hospitality and welcome.

Metallurgical Colloquia

In the latter part of 1976, Council recommended that the Mining and Metallurgy Technical Programme Committees give consideration to the organization of joint colloquia in collaboration with the Orange Free State-Klerksdorp and the Witbank-Middelburg Branches of the Institute. The first of these joint colloquia, which was held on 16th and 17th November, 1977, was attended by about 300 mining and metallurgical delegates. On the first day, the mining delegates attended their colloquium while the metallurgical delegates went on plant visits, and the reverse procedure was adopted on the following day.

The following papers were presented during the colloquium on 'Process development for the treatment of ores and residues for recovery of uranium and other values':

The South African programme on the development of continuous fluidized-bed ion exchange with specific reference to its application to the recovery of uranium, by A. K. Haines (National Institute for Metallurgy).

Amuran — the O.F.S. joint metallurgical complex for the recovery of sulphur, uranium, and gold from residues, by W. T. Ruhmer, F. Botha, and J. S. Adams (Anglo American Corporation of South Africa Limited).

The flotation of gold, sulphur and uranium values from O.F.S. residues, by G. Preller, and A.A.R.L. staff (Anglo American Research Laboratories).

Valuation of five flowsheets for the recovery of uranium from Witwatersrand ores, by D. W. Boydell (Atomic Energy Board) and, E. B. Viljoen (General Mining and Finance Corporation Limited).

The design and operation of a continuous ion exchange demonstration plant for the recovery of uranium, by W. M. Craig (Atomic Energy Board), A. K. Haines (National Institute for Metallurgy), M. E. E. Douglas (Rand Mines Limited), and G. D. Louw (Blyvooruitzicht Gold Mining Company Limited).

A brief description of a new metallurgical plant at the St Helena Gold Mines, by G. J. C. Young (St Helena Gold Mines Limited).

An integrated gold and uranium extraction plant, by M. K. Oertel, and D. J. Everett (Johannesburg Consolidated Investment Company Limited).

The chairmen of the two sessions were Mr S. A. Finney and Mr W. T. Ruhmer. The metallurgical plant visits included the new reduction works at St Helena Gold Mine, the Purlex uranium-recovery plant at Harmony Gold Mine, and the uranium, acid, and flotation plants at President Brand Gold Mine.

Particular appreciation is expressed to the Orange Free State-Klerksdorp Branch for their enthusiastic co-operation and the detailed planning for the quite unexpected influx of delegates who attended the colloquium.

On March 22nd, 1978, a colloquium on 'The merits of pilot-plants and problems of scale-up' was attended by approximately 225 delegates. Dr P. J. D. Lloyd and Mr G. S. James chaired the morning and afternoon

sessions respectively. The papers presented during this colloquium were as follows:

Data, design and decisions — the usefulness of pilot plants, by L. F. Engle (Davy Powergas Inc.).

Metallurgical test programmes for mine plant projects, by J. Kitagawa (International Bechtel Inc.).

Prediction of autogenous milling performance from pilot plant tests, by B. K. Loveday (National Institute for Metallurgy).

A pilot plant investigation of a kinetic model for flotation, by R. P. King (Department of Metallurgy, University of the Witwatersrand).

Pressure leaching of uranium bearing Witwatersrand ores, by H. Bovey, and L. N. Stewart (Anglo American Corporation of South Africa Limited).

Electric smelting in pilot versus industrial scale, by J. Gunderson and H. Skretting (Elkem-Spigerverket a/s).

Pilot plant data for fine coal beneficiation plant, by D. W. Horsfall (Anglo American Corporation of South Africa Limited).

Final arrangements have been made for a colloquium on 'Recent advances in the extractive metallurgy of gold' on 13th September, 1978, to coincide with the Electra-Mining Exhibition at Milner Park. Further joint colloquia are planned with the South African Institute of Foundrymen and the Coal Processing Society of South Africa, the latter to be held in collaboration with the Witbank-Middelburg Branch in Witbank.

Mining Colloquia

At the joint mining and metallurgical colloquium held in Welkom on 16th and 17th November, 1977, the following mining papers were presented on the first day and covered the general topic of 'Mechanical equipment for underground use'.

The introduction of tunnel-borers in Anglo American Gold Mines, by J. G. Taylor and A. E. Hall (Anglo American Corporation of South Africa Limited).

Blind-hole boring trials in Anglo American Corporation Gold Mines in South Africa, by W. J. van den Berg and J. G. Taylor (Anglo American Corporation of South Africa Limited).

Blind-hole boring, by R. More O'Ferrall and W. G. Goulding (General Mining and Finance Corporation Limited).

Stopecorer, by V. R. Conradi, B. S. Hill, H. J. Joubert, and A. C. Nesbitt (Stope Corer (Pty) Limited).

Planning product development trials, by M. G. Adamson and B. D. H. Phillips (Boart Research Laboratory).

Stope drill rigs tested at Rustenburg Platinum Mines, by C. R. Harrison (Johannesburg Consolidated Investment Company Limited).

Development mechanisation at Rustenburg Platinum Mines, by S. Stone (Johannesburg Consolidated Investment Company Limited).

Progress in the development of mechanised stoping methods, by N. C. Joughin (Chamber of Mines of South Africa Research Laboratories).

Visits arranged on the second day included the President Steyn underground refrigeration plant and sinking subvertical shaft, the sinking Unisel shaft on

St Helena, the tunnel borer at No. 5 shaft of Free State Geduld, the new hostel and kitchen at President Steyn, and the uranium, acid, flotation, and brickmaking plants at President Brand.

The second colloquium, which was held in Kelvin House on 5th April, 1978, the topic being 'Practical support methods', was attended by 173 delegates. The following papers were presented:

The introduction of sausage packs at Rustenburg Platinum Mines Limited (Rustenburg Section), by S. Stone (Johannesburg Consolidated Investment Company Limited).

Slime-cement fill as gold mine support, by R. More O'Ferrall and R. J. Macaulay (General Mining and Finance Corporation Limited).

Basic engineering principles for the design of sandwich-pack support, by W. D. Ortlepp (Rand Mines Limited).

The grouted skeleton pack, by M. G. Spengler (East Rand Proprietary Mines Limited).

Strain controlled tests on model mine supports, by G. E. Blight (University of the Witwatersrand).

Design and testing of pipe sticks for underground stope support, by P. J. J. van Vuuren (General Mining and Finance Corporation Limited).

Solid stonewall support at depth, by N. C. Joughin (Chamber of Mines of South Africa Research Laboratories).

A noteworthy feature of both colloquia was the extent and quality of the discussion after the presentation of the papers.

Vacation School — Mining

Due to the Commonwealth Congress, held in Hong Kong in May 1978, no vacation school was arranged after the two consecutive schools run in co-operation with the Mine Ventilation Society of South Africa in August 1977. Nevertheless, the committee was active in planning a school later this year in October — the topic being 'Drilling, rockbreaking and explosives techniques'. This school promises to live up to the usual high standard of previous years, and the Institute is indebted to the management of African Explosives and Chemical Industries in providing lectures and offering practical demonstrations.

Vacation School — Metallurgy

The vacation school in August of last year proved a worth-while exercise. Led by Prof. L. G. Austin, of Pennsylvania State University, and Mr A. R. MacPherson, of Canadian Bechtel Limited, supported by seven local lecturers, the school was attended by 56 delegates. The questionnaire completed at the close of the school indicated that participants had gained valuable theoretical and practical insight into the principles underlying grinding.

The Vacation School Committee has planned a school with the title 'Principles of flotation', which is scheduled for July 1979. This school has aroused a tremendous amount of interest, and almost a hundred delegates have registered. The school will be led by Profs. D. W. and M. C. Fuerstenau, who are acknowledged world leaders in the fundamental principles of flotation. Ten local lecturers will speak on various aspects of flotation

practice in South Africa. The school will again run as a continuing education exercise, with emphasis on the up-to-date presentation of material that should be widely known by engineers concerned with mineral beneficiation by flotation. All the major mining companies, as well as the chemical and equipment-supplying companies, have registered delegates for the school.

Monograph Series

Council decided after much debate and discussion to embark on a bold venture to produce a series of technical monographs and to market these throughout the world. There was much controversy as to whether the Institute should embark on a publishing venture of this kind, but Council believed the S.A.I.M.M. to be in the unique position to present, to the mining and metallurgical community of the world, up-to-date technical information representing recent advances in certain specialized fields.

Much of the material for these publications will be derived from the vacation schools that are held every year by the Institute. In these schools, experts from South Africa and other parts of the world present the most recent advances in selected topics. The lecture notes and course material will be edited and compiled into a suitable textbook format, and will be published as S.A.I.M.M. monographs.

In addition, the Institute intends inviting specialists to write the text for monographs on specific topical subjects.

The first of the series is a work by Dr D. G. Krige on geostatistics, which was produced early in 1978 and which has been very well received. Another volume, also on geostatistics, by Dr J. M. Rendu will follow shortly (publication in August 1978), and other volumes in the course of preparation deal with hydrometallurgy and rock mechanics. The Institute has been particularly fortunate in persuading Mr Dennis Malan to act as a Manager of a small group to undertake this publication venture. They are compiling a comprehensive list of names and addresses of prospective interested parties, and have written a highly efficient low-cost computer programme to produce selected addresses for the mailing of advertising literature and information pamphlets about the Monograph Series.

The first reactions to the venture have been very promising, and the Institute hopes that the mining and metallurgical community will regard the S.A.I.M.M. Monograph Series as one of the major features in mining and metallurgical literature.

Pyrometallurgical Discussion Group

The Pyrometallurgical Discussion Group held three meetings during the 1977-1978 year: on 28th July, 1977, 27th October, 1977, and 30th March, 1978, in the Lecture Theatre at Kelvin House.

This Group aims to provide an opportunity for the discussion of both general and specific topics in pyrometallurgy, which are reviewed by speakers known to be closely associated with their particular topics.

The speakers and their topics were as follows:

28th July, 1977

Modern trends in electric-arc steelmaking, by Mr F. I. de Waal (Isacor, Vanderbijlpark).

Current status of AOD steelmaking, by Mr D. H. Walker (Middelburg Steel and Alloys Limited).

27th October, 1977

New aspects in planning and constructing efficient smelters in South Africa, by Dr Werner H. Schwartz (Lurgi, Frankfurt/Main).

30th March, 1978

Alternative processes for making metallic aluminium, by Prof. K. Grjotheim (University of Oslo).

The Group was privileged to have Professor Grjotheim, a world-renowned authority on the chemistry of the production of aluminium and of molten salts, to address the meeting. He has published over 200 technical and scientific papers, as well as three books.

The Institute wishes to record its appreciation to Dr J. B. See, who acted as Discussion Group Convener for some years. Dr See has emigrated to America to take up the post of Professor of Chemical and Metallurgical Engineering at the University of Nevada. The Institute is grateful to Dr D. I. Ossin, who has undertaken the office of Convener.

French Mining Symposium

On the occasion of a visit of French mining engineers and manufacturers of mining equipment, the French Trade Commission requested the co-operation of the Institute and the Chamber of Mines of South Africa in organizing a two-day symposium on 'French mining equipment and techniques'. This was held at Kelvin House on 10th and 11th April, 1978, and was attended by 175 delegates.

The Symposium provided an opportunity for the exchange of new ideas in spheres of common interest to South African and French mining engineers, and a forum at which new developments in French mining techniques could be discussed in relation to technological advances in mining equipment. Several manufacturers of French mining equipment addressed the meeting, among them representatives of Samifer, Secoma, Oldham, Silec, La Stephanoise, Poclairn, Kleber-Colombes, Minex, and Sagem.

World Mining Congress

The Chairman of the South African National Committee on World Mining Congresses, Dr H. G. Denkhous, attended a meeting of the International Organizing Committee in Paris earlier this year, at which plans for the 10th World Mining Congress, to be held in Istanbul, Turkey, from 17th to 21st September, 1979, were discussed. The main theme will be 'Mining and mineral raw materials in the service of mankind'. The Congress arrangements include an exhibition of mining equipment, and technical and sight-seeing tours will be arranged both before and after the Congress.

Electra Mining Colloquium

The Institute plans a two-day colloquium to coincide with the Electra Mining Exhibition, due to be held in September 1978 at Milner Park. The metallurgical session is scheduled for 13th September and is entitled

'Recent advances in the extractive metallurgy of gold', and a total of thirteen papers will be presented. The mining session will be held on 14th September, entitled 'Developments in rock handling and earthmoving'. Ten papers and a film will be presented.

Eleventh Commonwealth Mining and Metallurgical Congress

The Institute of Mining and Metallurgy (London), on behalf of the C.C.M.M.I., organized the Eleventh Commonwealth Mining and Metallurgical Congress at the Excelsior Hotel and Convention Centre, Hong Kong, from 8th to 12th May, 1978. Some 450 delegates took part. Over two-hundred delegates and their wives attended from South Africa. A magnificent luncheon was held at the villa of Mr S. F. Hui on the Sunday before the Congress commenced. The opening ceremony of the Congress was performed by the acting Chief Secretary of the Government of Hong Kong, the Honourable P. C. Haddon-Cave, C.M.G., J.P., who stressed the capitalistic and free-trade nature of business in Hong Kong, which is totally dependent on trade for its financial livelihood. The inaugural lecture 'Raw materials, the Third World, and the European Community', was delivered by Christopher Tugendhat, Member of the Commission of the European Communities. Seventy-one papers were presented, of which twelve were from South Africa. A feature of the Congress was not only the high standard of papers, but also the considerable contribution made by delegates.

During the Congress, the International Mining and Metallurgical Exhibition was held in Kowloon; 32 companies participated, and, in addition to the congress delegates who visited the exhibition, other engineers from the Far East attended, including a Mission from China. Mr S. F. Hui generously made available his collection of mineral specimens and crystal models for display at the Excelsior Hotel. Delegates and their wives were entertained at a reception by the Government of Hong Kong on 8th May, 1978. There was a full-day excursion to Macau for all registrants and their wives, and a Congress dinner was held at the Excelsior Hotel on Friday, 12th May, 1978.

Pre- and post-congress tours were organized to Hong Kong, Australia, India, Indonesia, Japan, South Korea, Papua New Guinea, the Philippines, Thailand, and the People's Republic of China. As a large number of South Africans toured in Japan, a cocktail party was held in Tokyo at the end of the post-Congress tour, at which Mr P. A. von Wielligh spoke on 'The history of mining in South Africa' and Mr D. G. Maxwell on 'Extraction metallurgy in South Africa'.

Twelfth Commonwealth Mining and Metallurgical Congress

The Chairman of the Council of Commonwealth Mining and Metallurgical Institutions, Prof. M. G. Fleming, announced on 12th May, 1978, in Hong Kong at the conclusion of the Eleventh Commonwealth Mining and Metallurgical Congress that the Council had unanimously accepted an invitation from the South African Institute of Mining and Metallurgy and the

Geological Society of South Africa to hold the Twelfth Congress in Johannesburg in 1982.

The Associated Scientific and Technical Societies of South Africa

The Institute continued to participate in the activities of The Associated Scientific and Technical Societies, being, for instance, represented at the *Conversazione* arranged by A.S. & T.S. during the National Youth Science Week in July. S.A.I.M.M. representatives were able to meet the scholars and answer their questions about careers in the mining and metallurgical industries.

The A.S. & T.S. Trust is still making good progress, assisted largely by donations from its individual members. Members are thanked for their generous contributions.

It is pleasing to note that a prominent member of the Institute, Dr Austin Whillier, was the recipient of one of the two gold medals awarded by the A.S. & T.S. at its Annual General Meeting on 23rd November, 1977. The award was in recognition of his outstanding contribution to science, and the application of science to the control of the thermal environment in deep-level mining.

Mr Eric Hall presented his Presidential Address, entitled 'Our dynamic environment' at the same meeting. It received a very favourable reception, and was repeated later at two separate venues in Natal.

Concern was expressed in the Controlling Executive about the fact that, when matriculants elect to undergo military training prior to attending university, they could 'lose' a whole year should they be included in the July intake. The matter is still under investigation.

The A.S. & T.S. will celebrate their 60th anniversary in 1980, and a committee has been appointed to arrange suitable functions.

The Institute wishes to record its appreciation of all the services rendered by the A.S. & T.S., particularly the use of meeting and catering facilities in Kelvin House and the efficient secretarial services.

South African Council for Professional Engineers

A Bill to amend the Professional Engineers' Act of 1968 was introduced in Parliament during the recent session. The main points in the amendments provided:

- (a) for separate representatives on S.A.C.P.E. for the mining and metallurgical professions (at present there is only one representative for the two professions, although there are two Professional Advisory Committees),
- (b) for Professional Advisory Committees to be appointed by the Council instead of by the Minister,
- (c) for a recommendation to the Minister on the tariff of fees according to which a Professional Engineer may calculate the amount chargeable by him for work performed,
- (d) for work reserved for Professional Engineers, when undertaken by companies, to be performed by competent and qualified persons,
- (e) for the establishment of Boards of Control for certain professions and occupations allied to the engineering profession.

The Bill was referred to a select committee, which

received submissions from several organizations and individuals with many widely divergent views. A number of organizations are meanwhile preparing the groundwork for the registration of various categories of persons allied to the engineering profession.

At 31st March, 1978, the Council had 11 427 Professional Engineers and 1176 Engineers-in-Training registered. Of the 1277 corporate members of the Institute, 453 are registered as Professional Engineers. However, relatively few of the younger members are registered as Engineers-in-Training, reflecting the low number of new graduates that have been entering the mining and metallurgical professions in recent years.

The Federation of Societies of Professional Engineers

The Institute was represented on the Board of F.S.P.E. by two Council members, D. A. Viljoen and Prof. R. P. Plewman, with Dr M. G. Atmore and Dr M. D. G. Salamon as alternates. Perhaps the most important event during the year was the examination of the principal functions of the Federation and its relationship with member bodies. At a meeting attended by the office bearers of all the member societies, a list of functions was defined and consideration was given to the structure of F.S.P.E. Two meetings, initiated by F.S.P.E., were held for those members of societies not eligible for registration as Professional Engineers and who were neither Certificated Engineers nor Engineering Technicians. Implications of amendments to the Professional Engineers' Act, which aimed to accommodate these members under Boards of Control, were explained, and a committee of representatives from the various societies was elected to consider registration. After consultation with companies who would be affected by the proposed amendments to the Professional Engineers' Act, which were designed to exempt certain public utility corporations and companies from provisions of the Act, F.S.P.E. advised S.A.C.P.E. that insufficient time had been allowed for comments, and that no actual comment would be made.

At a seminar for Engineers-in-Training, the need for good, accessible mentors emerged as the most pressing need. Seminars on the training of Engineers-in-Training would be held annually in future.

In spite of a previous undertaking by the South African Defence Force concerning the training of Engineers-in-Training in the S.A.D.F., it was found, early in 1978, that engineering graduates were not employed in engineering work after their basic military training. After meetings between representatives of the S.A.D.F., S.A.C.P.E., and F.S.P.E., it was agreed that a special course for engineering graduates would replace the present basic training leadership course.

The Federation continued to sponsor articles in *Opportunities for matriculants and school leavers in South Africa* and *The South African careers guide*. A publication describing career opportunities in engineering would soon be issued twice a year to all national servicemen.

The Eighth Conference on Engineering Education, attended by 220 delegates, dealt mainly with mentors

and definition of training. Most member societies considered that these conferences were held too frequently, and it was decided that future conferences would be held only when the need had been clearly identified.

The subvention of salaries for engineering teaching staff at the universities is being investigated. F.S.P.E. policy in this regard should become clearer during the next session. An amount of R13 200 was collected by F.S.P.E. for the introduction of a partial engineering course in science degrees at Black universities. The first course introduced at the University of the North attracted 12 students. Interest in a similar course at the University of Zululand is evident, and the Federation is endeavouring to find suitable part-time lecturers to initiate the course.

A survey among member societies showed that an Advanced National Diploma should not merely aim at the replacement of part two of S.A.C.P.E.'s examination but should, in the first instance, be so introduced to afford promising students an opportunity to follow advanced technical courses. It was felt that the A.N.D. merited existence in its own right.

Concern was expressed that the societies would become fragmented if separate membership of F.S.P.E. were granted to societies who could join existing member societies. During the year, the Federation discussed, with the appropriate government department, a complaint that South African engineers were not given full opportunity to take part in State projects, to the advantage of foreign companies.

The Federation agreed to offer limited financial assistance, and also was willing to help with the drawing up of a constitution for the establishment of a society for the engineering profession in S.W.A. As a result of criticism on the grounds that F.S.P.E. should not independently initiate any action likely to alter its methods of working, the Rationalisation Sub-Committee was disbanded. The Federation subsequently formed a Committee for Advanced Planning and Future Policy, consisting of two Past Presidents of F.S.P.E. and the current President.

South African National Committee on Tunnelling

Despite difficulties experienced in the present economic climate, SANCOT enjoyed the active support of its corporate members.

The main tasks of the committee were the following:

Safety. A working group decided that the index of safety codes and procedures should initially be restricted to cover drilling, blasting and mechanical methods of rock excavation, the loading of rock, the transport of rock, material and men, the support of tunnels, the control of environment in tunnels, and the training of tunnelling personnel. It was agreed in principle to work towards the internationally recognized standard system of colour coding and safety signs developed by the International Standards Organisation (ISO). In close collaboration with the South African Bureau of Standards, work on safety signs has commenced for the indication of dangerous objects and places, and for traffic control.

Research. The findings of the two sub-committees

dealing with research matters indicated that only two organizations in South Africa conducted systematic tunnelling research: the Council for Scientific and Industrial Research and the Chamber of Mines Research Organisation. The major proportion of the R200 000 per annum spent by these organizations is related to mine tunnels. It was recommended that, in addition to a greater participation by the Government in tunnelling research, more could be achieved by a co-ordination of project-related research work and proper documentation.

Contracting Practices. A memorandum 'Contracting practices for underground construction in South Africa' and a working document entitled 'Comments and recommendations on certain aspects of contracting practices for underground construction' have been forwarded to the International Tunnelling Association.

Review of Existing Legal Requirements in Tunnelling. The review of the Mines and Works Act to give recognition to the special circumstances of civil-engineering tunnels was completed, and the amendments and recommendations are to be submitted to the Regulation Committee of the Government Mining Engineer. Much progress has been achieved in the review of the Regulations, and SANCOT recommends that there should be two sets of regulations: one for Mines and Works, and one for civil-engineering subterranean tunnels.

Collection of Demand Data and Statistical Demand Forecast. In view of the present uncertainty concerning civil-engineering projects, it was difficult to justify a reliable forecast up to 1980, but the next forecast would be for the 1980-1985 period. Preparations for the catalogue of tunnel works was proceeding satisfactorily.

The cutback in the rate of spending in the public sector had resulted in a drastic reduction in civil-engineering tunnelling activity. This trend was, in part, compensated for by increased activities in the field of shaft sinking and tunnelling in mines.

SANCOT continues to provide a forum for exchanges of opinion and information among all organizations and institutions involved in and concerned with tunnelling.

Orange Free State-Klerksdorp Branch

Committee

A. N. Shand (Chairman), H. M. W. Eschenburg (Vice-Chairman), G. J. C. Young (Immediate Past President), A. R. Godfrey (Honorary Secretary), and E. J. Dominy, A. H. Edwards, E. C. Hunter, Z. J. Lombard, J. Scott, and P. S. Wentworth.

As Mr Edwards was transferred during the year and Mr Scott would be retiring in the near future, both were obliged to resign from the Committee. The Chairman wishes to record the Branch's appreciation of the work performed by these two gentlemen, particularly during the O.F.S. Colloquium.

Meetings

The main event of the year was the O.F.S. Colloquium, which was held on 16th and 17th November, 1977, and which proved most successful.

Two general meetings were held during the course of the year, attended respectively by 65 and 35 members.

Presentations during the year included the following:

A preview of the activities of the Institute, by Dr M. D. G. Salamon.

South African techniques in shaft sinking — Film.

The East Driefontein story — Film.

The Mercedes-Benz experimental safety vehicle — Film.

Three committee meetings were held during the year. The Chairman records his appreciation of the assistance given him by the members of the outgoing committee in what has been a busy year for the Branch.

Membership

The total membership of the Branch on 29th June, 1978, was as follows:

Fellows	18
Members	52
Associate Members	40
Graduates	13
Students	10
	—
Total	133
	—

This represents a small increase over last year's figure, due mainly to the fact that more members' addresses are known. The Branch urges all members moving into the area to establish contact so that they can be kept informed of the Branch's activities.

Finance

The Branch incurred no expense during the year. A banking account is not operated. The Chairman wishes to thank the managements of the mines in the area for their generosity, without which the Branch could not operate.

Witbank-Middelburg Branch

Committee

T. S. Wilmot (Chairman), R. B. Smith (Vice-Chairman), E. J. Jackson (Honorary Secretary), and R. Cowley, G. Carlyon, A. L. Melvill, W. Weber, D. Walker, A. N. Turner, and K. Schleicher.

During the year under review the Branch was supported by one-third of the 63 known members, a small improvement on the previous year.

Meetings

Four committee meetings and three general meetings were held during the year. Addresses presented at the general meetings were as follows:

3rd November, 1977: The background, aims and financial demands of the Sasol Secunda operation, by Mr P. Kruger, Manager of the Sasol Secunda project.

9th March, 1978: The thermal uses of coal through the ages and the future outlook with the current energy crisis, by Mr D. W. Horsfall, Consulting Coal Process Engineer, Anglo American Corporation.

18th May, 1978: The Black Mountain Project, its potential and strategic value to the South African economy, by Mr E. Stolz, Consulting Metallurgist for Gold Fields of S.A. Limited.

Finance

All the activities were self financing. The balance in the bank account at the end of the year was R38,48.

The Chairman wishes to thank committee members for their support during the year, and requests the Branch members to give the incoming committee even greater support during the new year to ensure that the Witbank Colloquium scheduled for October 1979 will be an outstanding success.

Honorary Services

Appreciation is recorded for the services of the Honorary Legal Advisors, Messrs van Hulsteyn, Duthie and Saner, and the Council is most grateful for the invaluable assistance given to the Institute by the Honorary Treasurer, Mr J. K. E. Douglas.

The organization of the many and varied functions of the Institute demands much time and effort on the part of the committees and their chairmen, and gratitude is expressed to these persons for their co-operation during the past year.

THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY

Balance Sheet at 30 June, 1978

1977		1978		1977		1978	
R	R	R	R	R	R	R	R
CURRENT LIABILITIES				CURRENT ASSETS			
14 448		12 903		20 691		5 994	
998		725		20 536		— fixed deposit including accrued interest	20 536
14 557		—		20 576		— short term deposit	39 500
				1 375		— at call	584
	30 003		13 628		63 178		66 614
ACCUMULATED FUNDS				Debtors			
75 867		85 640		240		Debtors for sales of journal and publications, less provision	1 961
18 355		16 260		4 400		Advertisers in journal	5 376
		101 900		10		Witbank-Middelburg branch	10
94 222				3 290		July 1978 (1977 July-August) Vacation School — expenses to date	551
7 700		9 000		2 509		Sundry	2 359
882		353			10 449		10 257
8 582		9 353		222		Stock — ties at cost	135
	85 640		92 547	1		— journals at nominal value	1
			11 025	1		— publications at nominal value	1
			174	224			137
FOUNDRY TRUST FUND, as per contra				195		Deposits	220
				226		Subscriptions in arrear, less provision	442
664		717		1 521		Amount due from Education Fund	—
53		58		126		Amount due from MacArthur Memorial Fund	—
	717		775		75 919		77 670
EDUCATION FUND, as per contra				INVESTMENTS			
66 253		76 181		24 860		Quoted shares and debentures	24 860
7 700		9 000		1		(market value R28 190; 1977—R21 861)	
6 480		7 785		13 000		Unquoted shares	1
		92 966				Loans and unquoted debentures	13 000
80 433		2 686		37 861			37 861
4 233		1 057		1 860		MEDALS	1 840
19				1		At cost	
	76 181		89 223	1		FURNITURE	1
MACARTHUR FORREST MEMORIAL FUND, as per contra				1		At cost less depreciation	1
5 881		6 628		1		DIES	1
882		353		1		At cost less depreciation	1
565		676		1		BANNER	1
		7 657				At nominal value	
7 328		300		717		FOUNDRY TRUST FUND INVESTMENT, as per contra	775
700						Building Society Savings Account	
	6 628		7 357	5 999		EDUCATION FUND INVESTMENTS, as per contra	
				4 204		R6 173 8% Durban local registered stock 1995	5 999
				13 175		Building Society savings account	9 549
				34 128		Building Society fixed deposit including accrued interest	13 177
				17		Quoted debentures	29 277
				20 179		(market value R26 840; 1977—R30 633)	
				77 702		Unquoted shares	17
				(1 521)		Unquoted debentures and loans	20 179
							78 198
						Add: Amount due from general fund	11 025
					76 181		89 223
						MACARTHUR FORREST MEMORIAL FUND INVESTMENTS, as per contra	
				627		Building Society savings account	1 056
				2 023		Building Society fixed deposit including accrued interest	2 023
				591		R600 6½% Electricity Supply Commission Local registered stock — 1989/91	591
				1 811		Loan	1 811
				2		Unquoted shares	
				1 700		Participation bonds	1 700
				6 754			7 183
				(126)		Add: Amount due from general fund	174
					6 628		7 357

R199 169

R214 729

R199 169

R214 729

To the members,

THE SOUTH AFRICAN INSTITUTE OF MINING AND METALLURGY.

We have examined the attached balance sheet and income and expenditure account. In our opinion they fairly present the financial position of the Institute at 30 June 1978 and its income and expenditure for the year ended on that date.

ALEX, AIKEN & CARTER,
Chartered Accountants (S.A.), Auditors

22 August 1978

